

CLEAN COPY OF THE AMENDED CLAIMS

4. (Thrice Amended) A monoclonal antibody or recombinant antibody fragment having the capability of binding a human gamma-carboxylated osteocalcin fragment, comprising the amino acid sequence

C₁

6 7
Tyr-Leu-Tyr-Gln-Trp-Leu-Gly-Ala-Pro-Val-Pro-Tyr-Pro-Asp-Pro-Leu-
17 21 24 30
Glu-Pro-Arg-Arg-Glu-Val-Cys-Glu-Leu-Asn-Pro-Asp-Cys-Asp-Glu-Leu-
Ala-Asp-His-Ile-Gly-Phe-Gln-Glu-Ala-Tyr-Arg-Arg-Phe-Tyr-Gly-Pro-
Val (SEQ ID NO:2)

in which at least one of the glutamic acids in positions 17, 21 and 24 is gamma-carboxylated, characterized by the specificity to epitopes that have been identified on the gamma-carboxylated fragment of osteocalcin, wherein said fragment spans either

- i) from the amino acid in position 7 to the amino acid in position 30, or
- ii) from the amino acid in position 6 to the amino acid in position 30 of the amino acid sequence of SEQ ID NO:2, and that all three glutamic acids in the positions 17, 21 and 24 of said sequence are gamma-carboxylated.

6. (Amended) A non-competitive immunoassay for quantitative determination of a gamma-carboxylated osteocalcin fragment, comprising the amino acid sequence

C₂

6 7
Tyr-Leu-Tyr-Gln-Trp-Leu-Gly-Ala-Pro-Val-Pro-Tyr-Pro-Asp-Pro-Leu-
17 21 24 30
Glu-Pro-Arg-Arg-Glu-Val-Cys-Glu-Leu-Asn-Pro-Asp-Cys-Asp-Glu-Leu-
Ala-Asp-His-Ile-Gly-Phe-Gln-Glu-Ala-Tyr-Arg-Arg-Phe-Tyr-Gly-Pro-
Val (SEQ ID NO:2)

C2
int
in which at least one of the glutamic acids in positions 17, 21 and 24 is gamma-carboxylated, characterized in that a sample containing said fragment is exposed to two monoclonal antibodies or recombinant antibody fragments which bind said gamma-carboxylated osteocalcin fragment, said monoclonal antibodies or recombinant antibody fragments are specific to epitopes that have been identified on the gamma-carboxylated fragment of osteocalcin, wherein said fragment spans either

- i) from the amino acid in position 7 to the amino acid in position 30, or
 - ii) from the amino acid in position 6 to the amino acid in position 30 of the amino acid sequence of SEQ ID NO:2, and that all three glutamic acids in the positions 17, 21 and 24 of said sequence are gamma-carboxylated.
-